

Social position reflected by contact call emission in Gelada baboons (*Theropithecus gelada*)

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Receipt of Ms. 27. 8. 1986

Gelada baboons are terrestrial primates with complex social organization (one-male-groups, all-male-groups, bands) inhabiting the highland savanna areas of Ethiopia. Although vocal behavior of this species has been discussed in various papers about its relatively well known ecology and social behavior (e.g. KUMMER 1975; KAWAI 1979; DUNBAR 1984), no detailed analysis of its acoustic behavior has ever been presented.

Within a comparative phylogenetic and ontogenetic study of primate vocalizations, we therefore have investigated the acoustic communication of two captive one-male groups of gelada baboons (group 1: 1 harem male with 4 adult females and two juvenile males; group 2: 1 harem male with 7 adult females and one juvenile female), maintained at a large outdoor enclosure and a smaller indoor one at the Zoological Garden "Wilhelma" at

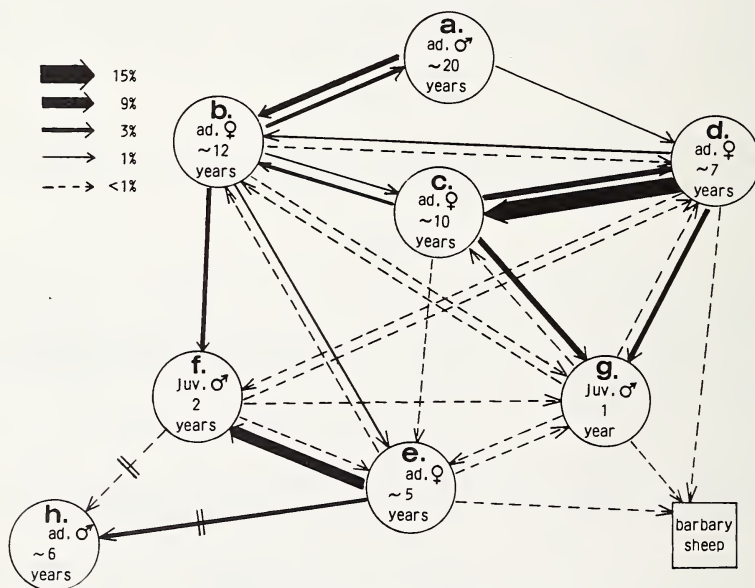


Fig. 1. Sociogram of social grooming relations of a one male-unit of gelada baboons. The width of the lines connecting different individuals represents the relative strength of their social grooming activity. (Values were calculated by dividing the observed time an individual spend on this behavior through the total observation time [= 100 %].) A subadult male of the neighbouring group is often found in the youngest female of the shown unit and was therefore included in the illustration by an interrupted line. Barbary sheeps living together with the geladas are sometimes groomed by members of the group, too

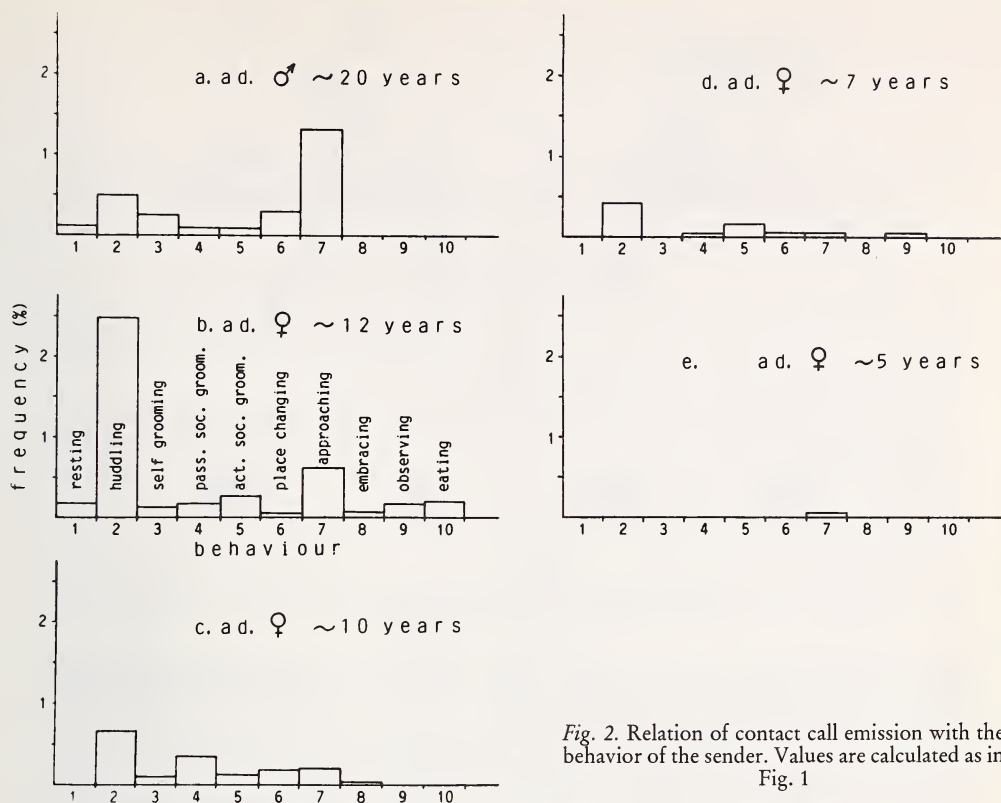


Fig. 2. Relation of contact call emission with the behavior of the sender. Values are calculated as in Fig. 1

Stuttgart. Techniques of behavioral data collection as well as sound recording and analysis correspond to that already described in prosimians species (ZIMMERMANN 1985).

We present here a part of this study demonstrating the influence of social position to the frequency of contact call emission.

A prerequisite for any qualitative and quantitative analysis of acoustic communication is a precise knowledge of the social relations of each individual within a social group. To estimate this, we have established sociograms of social grooming activities between the members of one-male units, based on three months data collection by direct observation sessions. As illustrated by Fig. 1, social grooming activity is not equally distributed between the individuals within the group. The harem male a. concentrates most of his social grooming activity to one particular female b., who is the highest ranking female within the group. She receives grooming acts from all members of the unit, but, by herself, prefers grooming the harem male and her male infant. The other individuals form grooming dyads preferring one particular grooming partner. Female d. spends more time in grooming female c. than reverse, they both spend an equal amount of time grooming the male infant of female c. Female e. gives most of her grooming acts to the infant male (f.) of female b. as well as to a male from the neighbouring one-male group (h.), who is often sitting close to her. She, by herself, receives the least grooming acts from all the other individuals. Comparing this data with the literature (DUNBAR 1984), we can conclude that the rank order of the females is as the following: female b. > female c. > female d. > female e. Due to their age the two infant males have to be excluded from social hierarchy of adults.

Contact between members of the own unit is also maintained vocally by nearly constant

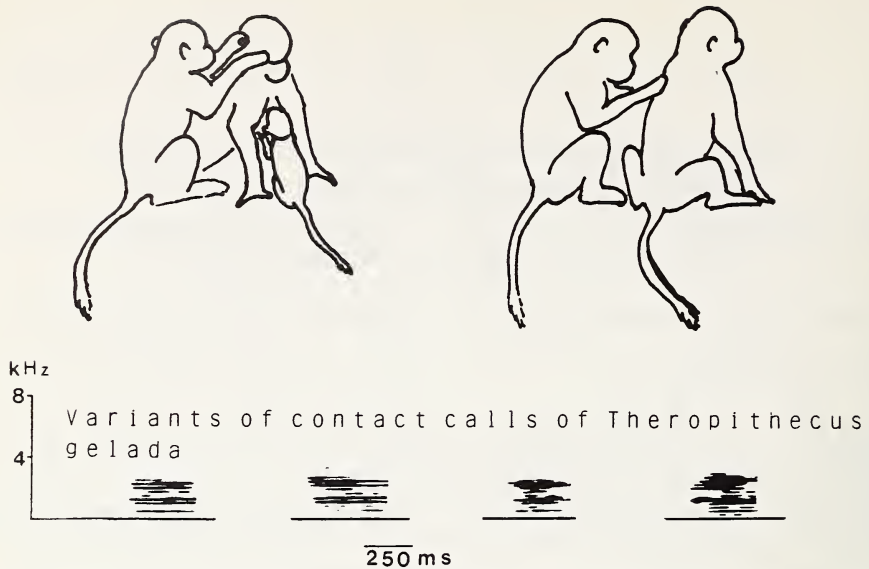


Fig. 3. Sonograms demonstrating representative acoustic patterns of gelada contact calls (below) and associated context (above)

frequency calls with harmonic structure often superimposed by noise (see Fig. 2 for sonograms, fundamental frequency 130–160 Hz, duration 200–280 ms) given as single call or call sequence with irregular intercall intervals before or during socio-positive social interactions (Fig. 3). Call emission is mainly associated with approaching one another, huddling together or grooming one another. It couldn't be recognized in the two infants. Comparison of the frequency of contact call emission of the different individuals with the information gained from the sociogram revealed that there exists a close correlation between social position and calling activity. Thus, the harem male as well as the highest ranking female show the highest calling rate, which declines rapidly from 4.5 % in female b. to 0.3 % in female e. A similar trend could also be found in the neighbouring one-male group. The effects, that may induce these differences in contact call emission as well as the generality of these findings for the species by itself have to be proved by further investigations.

Acknowledgements

We wish to thank Prof. Dr. W. NEUGEBAUER for the possibility of observing the monkeys and Dr. A. BROTZLER and the staff of the primate facilities at the "Wilhelma" for their support. We would also like to thank Prof. Dr. W. WICKLER, Max-Planck-Institut für Verhaltensphysiologie, Seewiesen, for giving us the opportunity to work with the spectrum analyser.

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